



Cabrillo Marine Aquarium Lesson Plan

Grade Level: First Grade

Title: How Do Whales Eat?

Objective: Students learn different ways whales eat by comparing baleen and teeth

California Science Standards: 1st: 2c, 2d

Time to Complete: 30 minutes

Materials provided by CMA Ocean Discovery Kits: *Worksheet: Whale Coloring Sheet, Whale: "Do-it, Do-its"*, Gray Whale baleen, Cetacean teeth (Sperm Whale tooth (replica), Orca tooth (replica), Dolphin and Fossil Dolphin teeth), Baleen Whale feeding demonstration (plastic "krill" and plastic "comb"), Toothed Whale feeding demonstration (tweezers)

Materials Provided by Teacher: Water in two wide-mouth, medium-sized bowls; a handful of rice that will replicate fish that toothed whales eat. Crayons and photocopies.

- ❖ NOTE: All Marine Mammals are protected by Federal Law. It is illegal to collect or possess marine mammals or any parts of a marine mammal (bones, baleen, etc.).

Vocabulary: Baleen, teeth, plankton, prey, keratin

Teacher Preparation: Have the baleen and toothed whale feeding experiments ready to use after the discussion.

1. Baleen whale feeding demonstration: Plastic spiders (pretend they are krill) floating in the water; comb (to replicate baleen) ready to filter large volumes of "prey" from the water.
2. Toothed whale feeding demonstration: Rice (pretend they are fish) and tweezers (to replicate a toothed whale) as the second experiment. Students will try to pick up one piece of rice at a time, just as toothed whales, such as dolphins, are only able to grab and swallow one fish at a time. Add rice just before students begin experiment (otherwise it will expand).

Background Information:

There are approximately 88 species of whales divided into two suborders based on their primary feeding mechanisms: toothed whales and baleen whales.

Baleen whales use keratin plates suspended from their upper jaw to filter food from seawater. These plates of baleen look like a large brush that traps prey, such as plankton (microscopic plants and animals) or small fish.

The most well-known of the filter feeding whales are the "rorqual" whales. "Rorqual" is a Norwegian word meaning "furrowed or grooved whale". This is referring to the large number of throat grooves, or "pleats" these whales have on their lower jaw, typically extending from the chin to the mid-body. These whales are casually referred to as "gulp feeders".

These "gulp feeding" whales open their mouth extending these pleats wide open, creating a large cavern inside their mouth. Then they engulf a mouthful of water along with all of the prey encompassed in the water. As the mouth closes, the muscular pleats squeeze shut forcing water out through the baleen plates. The baleen catches the tiny prey along the inside of mouth, then the whale swallows the whole mouthful of food. Through this type of filter feeding, whales can eat large volumes of prey in one gulp.

Toothed whales feed on a variety of sea animals, including many species of fish (ranging from small bait fishes to larger species such as mackerel) and squid. The teeth are used to grab their prey so it doesn't swim away. They grab and swallow their food, and do not tear or chew food as we do.

Some killer whales (also known as orcas) are an exception to the rule. Some killer whales eat large fish, such as salmon; others eat sharks; and still others eat small marine mammals such as sea lions, dolphins and even small whales. They have very strong jaws, instead of specialized cutting teeth, that are used to tear pieces of larger prey into small manageable sized pieces.

Lesson Outline:

Activity 1: Becoming a Whale

Activity 2: Eat Like a Whale

Activity 3: Color a Whale

Lesson Procedures:

Activity 1: Becoming a Whale

1. Follow the steps outlined in the *Whale: "Do-it, Do-its"* allowing the kids to act out the functions of whales' body parts and how they are different from ours.

Activity 2: Eat Like a Whale

1. Discussion: Tell students they are going learn how different animals eat. First, have students discuss how they eat, using their mouth, teeth and tongue. Then, ask if they have they seen other animals eat and how does it compare?
2. Discussion: What is the largest animal in the world? Whales. Yes, whales are the largest animal on earth, even larger than any dinosaurs discovered (so far!). Baleen whales include the largest of all animals in the world and they don't have teeth to

eat. Show photos and discuss how the baleen grows from the top of their mouths, instead of teeth.

3. Discussion: Baleen is made of keratin which is the same material as our hair and fingernails. Ask students to talk about the similarities in the way their nails and hair grow (continuously growing, breaking at the ends). Do baleen whales "lose" their baleen, like we lose teeth, or does it continue to grow? It continuously grows from the top, wearing at the ends.
4. Hands-on with specimens: Show students the sample of grey whale baleen. This sample has 10-15 plates. An adult gray whale will have 130-180 plates, per side of the mouth. Ask students to think about the quantity of prey the baleen will catch using this filtering method.
5. Now have the students use the comb to try and scoop up as many krill (plastic spiders) as they can. Then they can use the tweezers to pick up a piece of rice, one piece at a time. You can do these experiments in small group situations; try to allow all students to do the experiment.
6. Discuss the difference between the two types of eating, baleen versus teeth.

Activity 3: Color a Whale

1. Use the *Worksheet: Whale Coloring Sheet*

References:

DK Eyewitness Books: Whale: Pages 23 – 25

Book National Geographic Kids Great Migration Whales